## REMARKS

The foregoing amendment amends claim 1 and cancels claims 14-34. The amendment to claim 1 is supported by the specification. *See e.g.* page 69, line 12 - page 70, line 12. Upon entry of the amendment, claims 1-7 and 12 are pending in the application.

Claim 1

The Examiner rejected claim 1 under 35 U.S.C. § 103(a) as being unpatentable over JP Publication 2003-098205 ("Mitsuru"). In rejecting claim 1, the Examiner admitted that Mitsuru "fails to specifically disclose the auxiliary electrode forms a capacitance with the ground." However, the Examiner alleged that it would have been obvious that "the ground electrode should form a capacitance with the ground, since this is the well known, preferred method of grounding any electrical circuit, especially one in which the capacitance is measured elsewhere such as this application," citing Lessons in Electrical Circuits.

Claim 1 requires that a capacitance between the auxiliary electrode and a ground is larger than a capacitance between the first electrode and the second electrode. The specification describes an embodiment where the electric field sensor includes an EO crystal (electro optic crystal) 7, a signal electrode (first electrode) 11, a counter electrode (second electrode) 12 and an auxiliary electrode 61. When $\varphi$ denotes a potential difference between the signal electrode 11 and the ground, C1 denotes a capacitance between the signal electrode 11 and the counter electrode 12, C2 denotes a capacitance between the auxiliary electrode 61 and the ground, $\varphi 1$ denotes a potential difference between the signal electrode 11 and the counter electrode 12, $\varphi 2$ denotes a potential difference between the auxiliary electrode 61 and the ground, the following two expressions are established:

$\varphi 1 = \varphi * C2/(C1+C2)$

$\varphi 2 = \varphi * C1/(C1+C2)$.

The amplitude of the electric field within the EO crystal 7 is proportional to the potential difference $\varphi 1$. Therefore, in order to increase the amplitude of the electric field within the EP crystal 7 (i.e., increase the sensitivity of the electric field sensor), the electric field sensor

is designed to satisfy a relationship of the capacitance C2>C1 (preferably C2>>C1). This means that a capacitance between the auxiliary electrode and ground is larger than a capacitance between the first electrode and the second electrode. *See* page 69, line 12- page 70, line 12 and FIGS. 33 and 34.

Mitsuru describes that a ground electrode 31 is electrically connected to the second electrode 27. *See* [0031] and FIG. 1. However, applicant submits that Mitsuru fails to teach or suggest that a capacitance between the ground electrode 31 and the ground is larger than a capacitance between the first electrode 25 and the second electrode 27, as required by claim 1. Lessons in Electrical Circuits also fails to teach or suggest the relative capacitances recited by claim 1. The Examiner alleged that according to Lessons in Electrical Circuits, the ground electrode 31 should form a capacitance with the ground. However, as acknowledged by the Examiner, the capacitance between the ground electrode and the ground is a stray capacitance. *See* paragraph 7 of the Office action. A stray capacitance may introduce errors (stray current) into the associated circuits. *See* page 23 of Lessons in Electrical Circuits. A stray capacitance is generally set to be small so as to reduce errors (stray current) introduced into the associated circuits. Therefore, the combination of Mitsuru and Lessons in Electrical Circuits teaches that a capacitance between the ground electrode 31 and the ground is a stray capacitance that is smaller than a capacitance between the first electrode 25 and the second electrode 27. Thus, the combination of Mitsuru and Lessons in Electrical Circuits fails to describe that a capacitance between the auxiliary electrode and a ground is larger than a capacitance between the first electrode and the second electrode.

Claims 2-7 depend from claim 1 and are patentable for at least the same reasons discussed above in connection with claim 1.

Claim 12

The Examiner rejected claim 12 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,624,644 ("Ito") in view of U.S. Pub. No. 2004/0227942 ("Law"). In rejecting claim 12 the Examiner alleged that "the physical set up of Law is the same as in the

application, such that any light returning from the detector face would be polarized and reflected or transmitted in the same way as the claim limitation, preventing a return towards the electro optic crystal or variable retarders in the case of Law." Contrary to the Examiner's statement, the physical set up of Law is different than the claimed invention because the claimed polarizing beam splitter is distinguishable from the beam splitter 24 described in Law. The polarizing beam splitter transmits a P polarized light component of the incident light and reflects an S polarized light component of the incident light, thereby splitting the incident light into the P polarized light component and the S polarized light component. The beam splitter 24 of Law divides light beams E1 and E2 with polarization states P1 and P2 into two paths 26, 28. One path 26 carries light beams E1 and E2 to the distance measuring interferometry system. The other path 28 carries light beams E1 and E2 to components that monitor and maintain the polarization states of E1 and E2. *See* [0018] and FIG. 6D. The beam splitter 24 only guides the incident light into two paths 26, 28. It does not split the incident light into the light beams E1 and E2.

Even if a part of the circularly polarized light reflected from the interferometry passes through the second quarter-wave plate 602 to be converted into the S polarized light and a part of the circularly polarized light reflected from the light detector 40 passes through the first quarter-wave plate 600 to be converted into the P polarized light, the beam splitter 24 allows the S polarized light to pass through and reflects the P polarized light. This means that the circularly polarized light reflected from the light receiving surfaces of the light detectors 40 is not prevented from returning toward the light source 12. Thus, the combination of Ito and Law does not describe that the circularly polarized light reflected from the light receiving surfaces of the first and second photo detectors is prevented from returning toward the electro optic crystal, as required by claim 12.

## CONCLUSION

In light of the foregoing, it is submitted that the claims are patentable over the cited references and that the claims are in condition for allowance. No fees are believed due. However, the Commissioner is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account 11-0855. If there are any issues that can be addressed via telephone, the Examiner is asked to contact the undersigned at (404) 815-6500.

Respectfully submitted,

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